Why is legislation needed?

1.6 The existing legislative framework, contained in the *Broadcasting Act 1990,* already allows digital broadcasting via satellite or cable. But 'terrestrial' broadcasters (those who use land-based transmitters rather than cable or satellite) cannot go ahead with the new technology until the Government introduces legislation, because there is no provision to licence new terrestrial services.

1.7 The Government believes it is important to bring the legislation forward quickly:

- to let viewers and listeners have access as soon as possible to the new opportunities which digital technology could deliver;
- to allow terrestrial broadcasters a chance to compete with those on cable and satellite; and
- to unlock an important and exciting industrial opportunity.

1.8 Britain's broadcasters and programme-makers are world leaders. Digital broadcasting is an opportunity for them to move further ahead. It also creates important new markets for manufacturers of receiving and transmission equipment, both at home and for export. It will be a long-term investment for everyone, and not without risk. This makes it all the more important that the ground rules for that investment are carefully determined now.

Principles underpinning the legislation

1.9 Terrestrial broadcasting is different from cable and satellite in two important ways.

1.10 First, it is an immensely powerful medium in that it provides a route into almost every home in the country. Although digital technology will allow considerably more channels, their number will still be very limited. The regulatory framework needs to reflect this, and ensure a variety of services while safeguarding standards of good taste and decency.

1.11 Second, the amount of spectrum available for terrestrial broadcasting is limited and valuable. The Government must ensure that there is an effective and efficient mechanism for allocating that spectrum. And in the long term the Government wishes to do all it can to release spectrum by switching off existing analogue transmission signals, should digital broadcasting be successful enough to allow it.

1.12 The Government attaches great importance to 'public service' broadcasting – in its broadest sense the services provided by the BBC (television and radio), ITV, Channel 4, S4C and, in the future, Channel 5 – which is a vital part of life in this country. It educates and entertains; it provides extensive and impartial news coverage and stimulates public debate; and it seeks to cater for the interests of the few as well as of the many. These channels are the envy of the world, and the Government wants them to have the opportunity to benefit from the new digital technology.

1.13 It is in the public interest that a fair and effective competitive market should develop at each stage in the chain from producer to consumer. No public interest would be served by erecting unnecessary regulatory barriers to entry into the market. But public service broadcasters have to comply with exacting standards which other broadcasters do not. Their costs are therefore much higher, and the regulatory regime has to allow for that.

1.14 The rest of this document explains how the Government intends to deliver these objectives.

2 Digital Terrestrial Television

(i) Background

2.1 Digital technology allows a single frequency channel to carry several television channels. The exact number depends on the quality of picture required and so can vary from hour to hour, and even minute to minute.

2.2 In July 1994, the Government announced that as many as 12 digital terrestrial television channels might be available. Since then, that estimate has been revised upwards to at least 18. The Independent Television Commission (ITC) now hopes to identify six frequency channels giving substantial national coverage, though not all would be able to reach the same proportion of the population. Each would be able to carry at least three television channels of excellent picture quality. More channels may become available with more local coverage. Digital technology will increase even more dramatically, perhaps to over 200, the number of channels potentially available to cable and satellite customers. Annexe A gives more details of the technical capabilities of digital technology and the characteristics of the frequencies available.

2.3 Digital terrestrial television receivers could take two forms: separate 'set-top boxes' to allow existing sets to receive digital broadcasts, or new digital television sets, which would also be able to receive analogue services. It is likely that set-top boxes will be on the market first, perhaps by mid-1997. They will be cheaper and so initially more attractive than new digital sets, except to those purchasers intending anyway to replace their old equipment. In time, receiver manufacturers are likely to use common elements of digital satellite, cable and terrestrial television in their designs, and European standards have been written to facilitate this. However, it remains to be seen whether, or when, manufacturers will produce or market a single set-top box or receiver enabling consumers to receive digital terrestrial, satellite and cable television. Cable customers receiving digital services may in any case use a separate box supplied by the cable company, as they do now for existing cable services.

2.4 While some services on a digital terrestrial television network will be 'free to air', others are expected to be financed by subscription or by 'pay per view'. Set-top boxes and receivers will also therefore need to contain technology which will allow broadcasters supplying pay-TV services to ensure that only those customers who have paid for a particular channel or programme are able to receive it. This is known as 'conditional access', and is described in more detail in Annexe A, paragraphs A8–9.

2.5 Existing terrestrial broadcasters have for some time been interested in the possibilities offered by digital terrestrial television and are keen to ensure that their services are carried on it. The BBC would like to use digital technology to enhance its existing services, notably through widescreen broadcasts, and may also wish to

introduce, with the Government's approval, extra services on a commercial basis. Its programme catalogue and production capability, along with the widespread public respect for the standard of its services, make the BBC an important player in establishing digital terrestrial television.

2.6 The ITV companies also wish to offer services on digital terrestrial television, including perhaps a widescreen version of their existing service. They have more programmes than they can at present broadcast and have suggested that they might also use digital capacity to find space for some of these, as well as to offer new material. Many ITV companies are keen to expand into the pay-TV market where they would, of course, need to compete on the same terms as other providers of such services.

2.7 Channel 4 have expressed interest in digital transmissions in parallel with their existing analogue programming, and in the provision of a widescreen service. They are interested in the possibility of offering the full Channel 4 service alongside the Welsh language service in Wales. The Welsh Fourth Channel Authority (S4C) would like the opportunity to expand the coverage of the Welsh language service.

(ii) Current regulation of independent television

2.8 Three factors underpin the current regime for licensing commercial terrestrial television set out in the Broadcasting Act 1990:

- terrestrial television broadcasts have the capacity to reach nearly everyone in the UK who has a television set. Broadcasters using this medium are therefore in a uniquely powerful position;
- the number of services available has been severely limited by frequency availability; and
- it is the primary medium for the delivery of public service broadcasting, which has gained worldwide respect.

These factors do not apply to cable and satellite television.

2.9 The Broadcasting Act 1990 therefore established regulatory models for licensing all types of independent television services: terrestrial; domestic and non-domestic satellite; and cable. The ITC licenses satellite services uplinked from the UK and local cable delivery services in the UK, and conducts the tender process for cable franchise areas.

2.10 All licences contain taste and decency and general consumer protection measures. Licence holders must also comply with the ITC's Programme, Advertising and Sponsorship Codes. The licences include for terrestrial and domestic satellite broadcasters a 25 per cent minimum requirement for independent productions.

2.11 Terrestrial licence holders (Channels 3, 4 and 5) must meet a number of further conditions and positive programme requirements which do not apply to cable and satellite broadcasters. These extra conditions include minimum requirements for news coverage; programme quality and diversity; for Channel 3, regional programming; for Channel 4, education and innovation; technical and financial

requirements; and other matters. S4C's remit includes specific requirements for the provision of a Welsh language service and the scheduling of Channel 4 programmes.

2.12 The Channel 3 and Channel 5 licences are awarded by competitive tender. Additional data services, such as teletext, other than subtitling or information directly related to the programme service, are licensed separately. (Annexe A, paragraph A15 gives more information on additional services.)

2.13 The advent of digital terrestrial television will increase the number of channels available over time, perhaps by a factor of three or four. But the number, certainly in the medium term, will still be small in comparison with services available via satellite and cable. The position of influence, particularly of any 'free to air' channels broadcast terrestrially, will remain.

2.14 This suggests that, for the foreseeable future, the regulatory regime for digital terrestrial broadcasting will need to take into account some of the same factors which underpin the current framework. The remits for the public service broadcasters will remain and the availability of their services will also need to be assured, if and when analogue transmissions are turned off.

(iii) Allocating frequencies

2.15 At the moment, using analogue technology, frequencies are allocated to individual broadcasters. A whole frequency channel is needed for one television channel. Digital technology changes this, by allowing several television channels to be broadcast on the same frequency channel. The television channels are combined using computer technology known as 'multiplexing'.

2.16 If a frequency channel for digital broadcasting were allocated to a single broadcaster, that would mean allocating each broadcaster the equivalent of at least three television channels and potentially many more. The spectrum would effectively be in the control of perhaps only six broadcasters, so limiting opportunities for new broadcasters and for competition, and constraining the variety of programmes on offer to the viewer.

2.17 Frequency channels for digital terrestrial television will therefore be allocated to the providers of the multiplexes which bring together, prior to transmission, the batch of programme services on each frequency channel. Although imperceptible to viewers, the multiplex provider will be an intermediary between them and the broadcasters. To apply for the right to use a frequency channel, a multiplex provider will therefore need to have in place contracts with a number of broadcasters, each supplying one or more television channels to be broadcast through the multiplex.

2.18 Commercially, the multiplex provider will play a crucial role in the development of digital terrestrial broadcasting. It may be asked to organise the subscription management services for the pay-TV broadcasters. It may brand and promote the digital terrestrial broadcasters. The multiplex provider may also manage the 'trade' in digital capacity between broadcasters on a commercial basis (for example, when a broadcaster needs extra quality for special events). It will get a

return on its investment through commercial contracts with the broadcasters on its multiplexes and with any licensees who provide any additional services.

2.19 Following publication of the White Paper, *The Future of the BBC* (Cm 2621, July 1994), the Government is considering the options for the future of the BBC's transmission service, including privatisation. No decisions have yet been taken. Privatisation would lift the current constraint on BBC Transmission to compete for third party transmission contracts, including digital transmission.

Choosing multiplex providers

2.20 The Government intends that frequencies are allocated in a way which:

- will support the successful development of digital terrestrial television; and
- will impose the minimum possible regulatory burden while ensuring that viewers are offered a wide variety of services and protected from undesirable material.

2.21 The ITC will be responsible for allocating frequencies to multiplex providers. The Government will take certain powers of direction over the ITC on matters of general policy and principle (for example, in respect of the general organisation of competitions for frequencies). It will, however, be entirely for the ITC to award licences – and to monitor and administer the licensing system more generally – within the general criteria set out in legislation and by Government.

2.22 Applications for frequencies will be assessed against three main criteria:

(a) investment in infrastructure over time in order to provide services as quickly and as widely as possible across the UK;

(b) investment additional to (a) to promote the early take-up of digital television, including investment to encourage take-up of receivers; and

(c) the variety of programme services to be transmitted.

(a) and (b) Investment and promotion

2.23 Initially there may be six frequency channels available, with different coverage characteristics (see Annexe A, paragraph A11); more may become available later, perhaps with more restricted coverage. In order to achieve the full potential coverage levels for each frequency channel, multiplex providers will need to invest in the transmission network: some masts may need to be strengthened or raised in height; some additional equipment may be needed; and new transmitters will be necessary. Multiplex providers will also need clear and well-focused marketing plans to encourage viewers to invest in the new technology. The ITC will set minimum targets for geographical coverage and investment in promotion at certain points during the licence period, which prospective multiplex providers will have to meet or exceed.

2.24 Frequencies used for digital terrestrial television may cause some interference to video recorders and other domestic equipment, though the extent of any problem is not yet clear. The Government will be seeking technical advice from the ITC before deciding whether any special arrangements will be necessary. It recognises, however, that multiplex providers and broadcasters may find it in their commercial interest to offer advice and assistance to owners of video and other domestic equipment.

(c) Variety

2.25 The ITC will need to ensure, in awarding the frequency channels, that digital terrestrial television as a whole is launched with a diversity of services catering for different tastes and interests. It will therefore need to consider the variety of broadcasting offered by individual applicants against the overall pattern provided by all multiplexes.

Assessing the applications

2.26 The ITC will assess the viability of the applicants' business plans. It will take into account the financial resources of the applicants and their ability to develop and maintain services during the licence period.

2.27 The ITC will need to be satisfied that the proposals are technically sound. It will also need to ensure that the picture quality of broadcast services proposed is reasonable, having regard to the standards normally acceptable to viewers. The Government invites views on whether this might best be achieved through a technical code or other means.

2.28 It would be open to a prospective multiplex provider to apply without having filled all the capacity available on the multiplex, although it would have to satisfy the ITC as to the variety of broadcasting it intended ultimately to offer. The ITC will also need to take into account the provider's capacity to deal with the failure of individual broadcasters. Once a multiplex licence has been awarded, the provider will be free to fill any spare capacity on the multiplex, provided any new broadcaster can satisfy the ITC's licence conditions. Broadcasters will be able to move from one multiplex to another, subject to the terms of their contracts with the multiplex providers and the continued satisfaction of the ITC's licence conditions.

Payments to the Exchequer

2.29 The Government will also in principle wish to require multiplex providers to pay a percentage of qualifying revenue to the Exchequer once the operation becomes a profitable one and is considering whether the size of applicants' bids to make such payments should be a further criterion in allocating multiplex licences. Applicants for the initial licences will, however, need to invest significantly in infrastructure and other start-up costs. It may therefore be that no payment to the Exchequer should be required for the initial licence period, and that accordingly no such bids should be invited for the initial licence allocation. The Government would welcome views on these points.

(iv) Licensing

2.30 Multiplex providers will hold a new class of licence to operate digital terrestrial multiplexing services. Licences will last 12 years. At the end of the licence period the licence will be subject to further competitive tender against the criteria outlined above. A Telecommunications Act licence will also be required; where the multiplex provider is already licensed under that Act, extra conditions may be needed.

2.31 The conditions in these two licences will, *inter alia*, require the provider to treat broadcasters on the multiplex fairly, reasonably and in a non-discriminatory

way; to ensure that all broadcasters and non-broadcasters on the multiplex that need broadcast licences have them; to facilitate trading of digital bit-rate capacity between broadcasters if they so require, on a contractual basis; to conform with international and European technical standards; and to fulfil the commitments on coverage, promotion and variety contained in the application. The ITC will have the power to amend the licence conditions with the agreement of the licensee should circumstances change. The multiplex provider's relationship with the broadcasters will be otherwise governed by contract, and may include the provision of conditional access and/or subscription management services, alone or in association with other multiplex providers (see paragraphs 4.15–4.17).

2.32 Each broadcast service will need a licence from the ITC, which will include the same conditions as would licences for domestic satellite broadcasts (see paragraph 2.10), with the addition of the key programming proposals contained in the application which the relevant multiplex provider made to the ITC and except that the independent production requirement will be ten per cent. Licences will be for an indefinite period, but will only give a broadcaster the right to broadcast if it has a contract with a multiplex provider licensed by the ITC.

2.33 Digital technology offers broadcasters the possibility of splitting the capacity allocated to them, in order to provide extra programme services. A broadcast service of excellent picture quality could be replaced by two or more separate services of lower technical quality that would be quite satisfactory for some types of programme: for example, studio discussions.

2.34 Prospective multiplex providers will need to outline in their applications, if they can, the nature of any proposed split services. It will be open to broadcasters to split services after licences had been awarded, but this might need a variation in the licence conditions if the proposed services are not covered by the original licence. Multiplex providers will also need to ensure that any trading of capacity between broadcasters does not result in a significant reduction in the technical broadcast quality.

2.35 The ITC will have powers to enforce conditions in licences issued to multiplex providers and broadcasters where a licence holder is in default. It will be able to impose financial penalties, revoke licences or, in the case of multiplex providers, shorten the licence period. It will also be able to direct broadcasters to broadcast corrections or apologies, or not to repeat programmes. OFTEL already has powers to enforce the conditions contained in Telecommunications Act licences.

(v) Public service broadcasting

Principles

2.36 The Government believes in the merits of public service broadcasting and wishes to safeguard it into the digital age. The Government therefore believes that it is essential to give public service broadcasters the opportunity of a place in the new technology. This will also enable them to offer an improved service, for example through widescreen television, and will be in the interests of digital terrestrial

television as a whole, since the involvement of the existing broadcasters is likely to encourage consumers to move to digital.

2.37 The Government hopes that, in the long term, it will be possible to switch off the analogue signals in order to release part of the spectrum for other uses including, possibly, further digital broadcast services. That can only happen if the public service broadcasting, including regional variations, currently provided on analogue is equally widely available to viewers on digital television.

2.38 Public service broadcasters operate under stringent quality requirements, and their costs reflect that. The Government therefore wishes the ITC to make some digital slots available to such broadcasters on different terms from those which apply to broadcasters not operating under the same quality restrictions.

Guaranteed places

2.39 The Government proposes that the ITC should reserve a 6 Mbits/sec place on a multiplex (about one third of the capacity) for each of the following channels: BBC1, BBC2, Channel 3, Channel 4/S4C and Channel 5. Each slot will automatically be made available to the relevant broadcaster or broadcasters, provided that the broadcaster is able to make arrangements with a multiplex provider which meets the ITC's criteria. In recognition of the rationale for the guaranteed places (that is, to maintain public service broadcasting and ultimately to allow analogue signals to be switched off), the great majority of programmes on the analogue channel should also be shown on the guaranteed digital channel. The Government therefore proposes that at least 80 per cent of the programme hours provided on the analogue channel should be shown on the guaranteed digital channel, the majority of these being 'simulcast', that is, shown at the same time. In areas of the UK where existing broadcasters provide a distinct national or regional service, and unless there are overriding technical obstacles, at least 80 per cent of these programme hours should also be shown on the digital channel.

2.40 The digital services of independent public service broadcasters on their guaranteed place will be bound by the specific conditions of their existing analogue licences. If such a broadcaster loses or gives up its analogue licence, its digital licence will be revoked. The guaranteed place would then be made available to the new analogue licence holder. The services offered by the BBC will be bound by its Charter and Agreement.

2.41 The Government hopes that existing broadcasters will take up these guaranteed places, and believes that they have every reason to do so. Three months before the beginning of the application process for the digital frequencies, the Government will ask public service broadcasters for a commitment to take up the slots reserved. They will also need to agree to start broadcasting within a period specified by the ITC.

2.42 Should any eligible broadcasters not wish to take up this guaranteed place at the outset, the opportunity will be lost and the ITC will make the capacity available to other broadcasters through the general application process outlined above. However, the Government will take powers to allocate digital capacity to public

service broadcasters at some time in the future, should it be possible to switch off the analogue signal. The Government cannot forecast what capacity would be available at that stage, but the amount allocated to an individual broadcaster is likely to be less than currently proposed for the guaranteed slots.

2.43 If the BBC decides to take up either or both of its guarantees, the ITC will be required to ensure that the BBC's guaranteed services are carried on the frequency channel offering the greatest potential geographical coverage.

2.44 Guaranteed services could, at the broadcaster's discretion, be split to provide separate television channels which might consist of new, simulcast or rescheduled programmes. The channels must, however, continue to be free to air for as long as the Government requires, and between them satisfy the licence and simulcast requirements set out above. The guaranteed joint place for Channel 4 and S4C will be on condition that the broadcasters seek, either by splitting the service or rescheduling, or both, to make the full Channel 4 service available as far as possible throughout Wales without reducing the availability of the S4C service in Wales. S4C will need to be able to finance its guaranteed place from within existing funding arrangements.

2.45 At present, neither the precise characteristics of the frequency channels nor the intentions of existing broadcasters are known. This means that it is impossible to specify now the most effective way of running the application process for multiplex licences. Guaranteed places taken up by public service broadcasters could either be pre-allocated to particular frequency channels or be part of the application process (taking into account the particular position of the BBC set out in paragraph 2.43). Subject to the restrictions on ownership set out in paragraph 4.14 below, frequency channels might be offered individually or as packages of two or three. Packaging might provide a greater incentive to prospective investors but would reduce the number of providers. **The Government is keen to promote competition, but at the same time wants to ensure that the prospectus is attractive to those prepared to make the necessary levels of investment. It invites views on the factors which should be taken into account in drawing up guidelines for the application process.**

2.46 Public service broadcasters with guaranteed places will be free to expand within the ownership limits set out in Chapter Four. However, they will have to compete for any extra capacity on the same terms as other broadcasters. The BBC and Channel 4/S4C will be prevented from subsidising any new commercial venture from the funding arrangements for their existing or guaranteed services.

(vi) Additional services

2.47 Spare capacity within broadcasting frequencies is already used to transmit other services, such as teletext. These are known as 'additional services'. Digital technology could provide opportunities for the expansion of these additional services. This expansion could increase the appeal of digital receivers to the consumer. Services might include 'super-teletext', home shopping or the provision

of specialised information, for example on business and finance, to particular interest groups. Depending on technological developments, there may be scope for multimedia and interactive services and for data service providers to send messages to individual consumers or groups of consumers.

2.48 A considerable amount of information can be transmitted without adversely affecting television picture quality on the same frequency channel (for details see Annexe A, paragraph A15). The Government is aware of the potential for additional services and wishes to encourage their development, provided that it does not restrict capacity available for digital terrestrial television services, and is in line with policies on telecommunications services and the use of the radio spectrum.

2.49 Applications to the ITC for multiplex licences should include details of any additional services to be offered. The licences for digital terrestrial television broadcasters will automatically confer the right, subject to agreement with the multiplex provider, to use any capacity allocated to them to transmit, in addition to television programmes, certain additional services directly related to their programmes; for example, subtitling and conditional access data. Should broadcasters wish also to transmit other data, including teletext services, they will be able to apply to the ITC for an additional services licence. The licence conditions will be based on those which currently apply to additional services and will be enforceable in the same way, by means of fines or revocation. A licence from the DTI under the Telecommunications Act may also be needed, depending on the nature of the service.

2.50 The multiplex provider may also make some capacity available directly to non-broadcasters for additional services, again subject to licensing by the ITC and the DTI.

2.51 In the first instance, the Government believes that no more than ten per cent of any frequency channel should be reserved exclusively for additional services, whether operated by the multiplex provider, broadcasters or others. This proportion will be variable by Order in the light of technological developments and on advice from the ITC. As well as additional services provided on space exclusively reserved for that purpose, it may be possible for broadcasters to provide some additional services within the part of the signal being used for television transmission. These will not be included in the ten per cent figure. The ITC will ensure that the provision of any additional services is not at the expense of television picture quality.

2.52 For teletext services, the BBC will be expected to make provision within its own capacity. Multiplex providers will need to include in their applications proposals for any independent teletext services, within the capacity being made available for additional services.

3 Digital Terrestrial Radio

(i) Background

3.1 Seven frequency channels, each capable of carrying six stereo or a greater number of mono radio stations, should be available for digital terrestrial radio, known as digital audio broadcasting, or DAB. Two of these have been allocated for national services: one to the BBC for its national radio services, and the other for independent national radio (INR) services. Four frequency channels are reserved for local radio services. The Government is investigating whether the remaining frequency channel would best be used to provide additional quasi-national services, with limitations on coverage, or to allow more local stations in particular areas where demand is greatest, and invites views.

3.2 Improvements in sound quality, reception and ease of tuning will be important factors in the listener's decision to invest in a digital radio receiver. Car radios will be a major market; the quality of reception would be significantly improved and the need to retune in different parts of the country removed, by the introduction of national services on single frequency networks. There are currently few digital receivers in the market, and the speed with which attractively priced sets become available, both for cars and the home, will be crucial to the success of digital radio.

3.3 The BBC is the largest single provider of radio services at national and local level. Its decision to start digital broadcasting from the autumn of this year should give an impetus to the receiver market, and make a move into DAB more attractive to commercial broadcasters.

3.4 The BBC's digital plans are to roll out Radios One to Five, with some new services (including Parliamentary coverage, education and sport), over a three to four year period to around 60 per cent of the UK population. It intends to expand its coverage outward from London along the motorway corridors, reflecting the importance of DAB to the car radio market. It is likely that an independent national multiplex provider and broadcasters would follow the same pattern. Listeners living in major conurbations along motorway routes may therefore be most likely to invest in digital receivers in the home, which may in turn affect the pattern of interest in providing local digital radio.

(ii) Current regulation of independent radio

3.5 Independent radio licences for national and local services are issued by the Radio Authority. The *Broadcasting Act 1990* requires the Authority to do all it can to secure a variety of national and local services which, taken as a whole, are of high quality, and to ensure fair and effective competition. There are three national analogue stations – Classic FM, Virgin 1215 and Talk Radio UK. The Act requires

one national service consisting mostly of spoken material and one consisting mostly of music which is not pop music.

3.6 National licences are awarded by competitive tender with a cash bid. Local licences are advertised and awarded on the basis of the services proposed. The licences specify the nature of the programme service to be provided. Licences last for eight years, at which point they are subject to further competitive tender or re-advertised. The Authority can also allocate Restricted Service Licences, for example for special events, or hospital or student radio, and additional service licences.

3.7 This framework was designed to deal with a two-tier independent radio network offering a very limited number of national channels and a larger number of local services. The advent of DAB provides the potential for a limited expansion of national and local services.

(iii) Guaranteed places

3.8 Unlike for television, public service broadcasting on radio at national and local level is primarily the responsibility of the BBC. The BBC's services (both existing and digital) must conform with its Charter. By contrast, the regulatory regime for independent radio services is much lighter than that which applies to television, and there are no specific quality thresholds for licence holders.

3.9 The allocation to the BBC of a national multiplex will ensure the maintenance of national public service broadcasting. The Government will also ensure that BBC local services are carried by local multiplex providers (see 3.19).

3.10 The second national multiplex provides the capacity for at least twice as many INR services as currently exist. These will be valuable opportunities, potentially attractive to many aspiring as well as existing broadcasters. The existing national stations will be in a strong position to mount DAB services, probably to simulcast their analogue services, though with the flexibility to reschedule or split the service on occasions. In order to prepare for the possibility in due course that the existing signals will be switched off, the Government proposes to offer guaranteed places to the three existing INR licence holders. These will be subject to the same conditions as those imposed on the guaranteed slots for digital television.

(iv) Allocating frequencies

3.11 The licensing of multiplex providers, independent broadcasters of DAB services and additional service providers will be the responsibility of the Radio Authority which, like the ITC, will be subject to any directions given by the Government. It will be for the Authority to decide how best to organise competitions for the multiplex provider licences, within the regulatory framework established. Licence conditions will be enforceable in the same way as proposed for television. Telecommunications Act licences will also be required.

National radio

3.12 The licence for the national multiplex provider will be awarded following competition. Prospective multiplex providers will be invited to apply for the frequency channel against the same criteria as those proposed for television. The Authority will also assess the viability of the business plans, and will issue a technical code. **As for television, the Government is considering the issue of payments to the Exchequer and would welcome views.**

3.13 In assessing applications from prospective multiplex providers, the Authority will need to take into account the variety of broadcasters which the provider intends to offer in order to ensure a diversity of national DAB services catering for different tastes and interests. **The Government invites views on the precise nature of the arrangements, but is minded to require that of the six or more potential services: one should consist largely of spoken material; one should consist largely of music which is not pop music; and no more than two should, in the opinion of the Authority, be aimed at predominantly the same section of the radio audience.**

3.14 The successful multiplex provider will hold a new class of licence to convey DAB services. The licence will last 12 years, and its conditions will be as proposed for television. Each new broadcast service will be separately licensed for an indefinite period. To ensure diversity, the Government is minded to require that under normal conditions no more than 256 kbits/sec will be allocated to each broadcasting licence. This amount will be amendable, by Order, to reflect any new technological developments. Broadcasters could control less than 256 kbits/sec. The general licence conditions will be the same as those which currently apply to holders of INR licences. Once the nature of the service to be provided is established, this will become part of the individual licence conditions. Split services will be licensed in the same way as for television.

3.15 The DAB services of existing INR licence holders taking up a guaranteed place will be bound by the specific conditions of their existing analogue licences, and their digital licences will be co-terminous. If an existing INR broadcaster loses or gives up its analogue licence, its guaranteed DAB place will be forfeited and its DAB licence revoked. The guaranteed place would then be made available to the new analogue licence holder.

3.16 The Government recognises that the current licensing system for INR stations, which requires competitive tender exercises every eight years, is felt by some to be inappropriate and may be a disincentive to investment in DAB. **It is therefore reviewing the current arrangements and invites views on any alternatives which would still ensure that services stay fresh and that the true market value of licences is realised.**

Local radio

3.17 The Government proposes to deal with local digital radio on an area by area basis. This will build on the current regulatory framework and help to ensure that local radio services reflect the tastes and interests of listeners in the area. Given the different existing arrangements for local radio, the Government is not minded to require any payment to the Exchequer as part of the process of application for a local multiplex. It also accepts that restrictions on the spectrum available for local services, and the economics of DAB, mean that it is unrealistic at this stage to anticipate a transfer of all existing local radio services to DAB, although this may change in the long term. As a result of this, no guaranteed places will be offered to existing local broadcasters.

3.18 The Radio Authority will therefore seek applications from prospective multiplex providers for each of the DAB areas making up the local area network. Prospective multiplex providers will be invited to put forward proposals covering infrastructure investment and coverage within the area over time, and the variety of broadcasting services they intend to provide.

3.19 The Authority will agree with the BBC an allocation of capacity for BBC local radio on the multiplex in any local area. In Scotland, Wales and Northern Ireland, this allocation will need to allow for the BBC's national services for those countries. The Authority will then ensure that the BBC's agreed requirements are accommodated on each local multiplex. The Authority will also assess the technical competence and viability of the applications.

3.20 All applicants will need to show evidence that their proposed mix of broadcasters reflects as far as possible the varied tastes and interests of the local radio audience. The Authority will take into account the mix provided on DAB and the overall mix available from both DAB and analogue broadcasters in the area.

3.21 Licensing of local multiplex providers and broadcasters will reflect the arrangements at the national level.

(v) Restricted Service Licences

3.22 Restricted Service Licences (RSLs) are currently issued by the Radio Authority for radio broadcast services limited by time, by space or both. The Government believes that organisations holding RSLs have made a distinctive and valuable contribution to UK radio and wishes to continue to provide opportunities for such organisations on both analogue and digital frequencies. RSLs for digital broadcasting will be issued by the Authority, and it will be for the applicant to make contractual arrangements with the multiplex provider. The multiplex provider's licence will require it to allocate capacity at reasonable cost for RSL holders, provided that capacity can be made available with the agreement of the other broadcasters and with no significant effect on the technical quality of other services.

(vi) Additional services

3.23 It is already possible, subject to licence, for any spare capacity available in the FM spectrum to be used for text-based data services. DAB receivers will be able to incorporate a screen displaying text, or even simple still images. This might be used, for example, to give the listener information about a piece of music being played, as well as for more general purposes akin to television teletext. DAB frequencies could also be used for specialised data services aimed at particular interest groups; vehicle location and route finding services, for example, might be popular with consumers with DAB receivers in their cars. The BBC has already indicated that it wishes to use part of its own allocated capacity for data services.

3.24 Applications to the Authority for multiplex licences will need to include details of any additional services to be offered. Should holders of DAB licences also wish to transmit other data they will be able to apply to the Radio Authority for an additional services licence, the terms and conditions of which will be as for additional services on digital terrestrial television. A DTI Telecommunications Act licence may also be required. The Authority will regulate additional services provided by broadcasters or multiplex providers in the same way as the ITC. It will be for the Authority to advise, in the light of technological developments, the maximum proportion of any frequency channel which might be used for additional services. In doing so it will ensure that that proportion is not so great as to produce an unacceptable reduction in the number or technical quality of audio services. In the first instance, the Government believes that no more than ten per cent of any frequency channel should be used in this way. This proportion will be variable by Order, on advice from the Authority.

4 Competition and Ownership

(i) Principles

4.1 The Government set out its policy on ownership in *Media Ownership: The Government's Proposals*, (Cm 2872, May 1995). Two clear principles underlie that policy.

4.2 First, television, radio and the press play a unique role in the free expression of ideas and opinion, and thus in the democratic process. It is therefore vital to secure a plurality of sources of information and opinion, and a plurality of editorial control over them.

4.3 Second, the Government has the responsibility to set a framework which will enable UK broadcasters, programme-makers and equipment manufacturers to take full advantage of major market opportunities.

4.4 The same principles apply to digital broadcasting. As and when digital technology takes off, the Government expects that ownership of digital broadcasters will be regulated through the long-term framework canvassed by the Government for the media market as a whole.

4.5 The digital markets do not yet exist, however. At the outset, digital broadcasting is likely to represent a tiny share of the total media market. At that stage, regulation by total market share, or even total television or radio market share, would not deliver diversity and plurality in digital broadcasting. And the Government is in any case some way off introducing the long-term framework for the rest of the media market.

4.6 The proposals set out below are therefore for the medium term only. They are consonant with the medium-term proposals which the Government intends to introduce for the rest of the media market. How quickly it is possible to move beyond this to a system based on share of the total media market will depend on the pace of development and take up of the new technology, and on the broader degree of consensus surrounding long-term reform of the overall structure of media ownership regulation.

(ii) Television ownership

4.7 For digital satellite and cable television broadcasting services, the Government proposes to replicate the proposed new regulatory arrangements for analogue, satellite and cable, as set out in *Media Ownership*. Broadcasters will therefore be free to control any number of digital satellite and cable channels up to 15 per cent of total television audience share.

4.8 For digital terrestrial television, the Government proposes that:

(i) subject to a limit of 15 per cent of total television audience share, companies (including Channel 3 and 5 licence holders, satellite and cable broadcasters and newspaper groups) shall be able to control only a percentage (amendable by Order) of the available bit rate capacity outside that allocated to guaranteed places. The Government is minded to set the threshold at 25 per cent;

(ii) newspaper groups whose regional and local titles account for more than 30 per cent of regional or local newspaper circulation within the broadcast area for a regional or local digital television service shall be prevented from having more than a 20 per cent stake in any such licence;

(iii) cross-holdings between digital or analogue local radio and digital or analogue regional television licences will be limited to 20 per cent where their broadcast areas significantly overlap.

4.9 The existing 'connected persons' arrangements set out in the *Broadcasting Act 1990* will apply. In addition, for the control of digital broadcasting licences only, in relation to newspapers and broadcasters (analogue or digital), persons will be deemed to be connected if a newspaper group's level of investment in the broadcaster is over 20 per cent (or vice versa).

4.10 The Government also proposes that, in considering applications for digital terrestrial broadcasting licences where control of the licence would now rest with a newspaper company, the ITC should consider whether it is in the public interest that the licence should be granted. In doing so, it would apply the public interest criteria set out in the policy document, *Media Ownership*:

- **Promoting diversity.** These interests lie in ensuring a diversity of media material, the expression of a range of views, accuracy in factual information and, for the broadcast media, accuracy and impartiality in news provision.
- **Maintaining a strong industry for the economic benefit of the country.** This would include consideration of export potential, technical development and job creation.
- **Ensuring the proper operation of markets.** This would include consideration of competition issues, such as ensuring access for new entrants, and preventing cross-subsidy between media outlets and predatory pricing.

The licensing implications of subsequent proposals for mergers between digital television and newspaper companies would also be considered by the ITC against these public interest criteria.

(iii) Radio ownership

4.11 The Government will establish a parallel ownership regime for digital radio which replicates the Radio Authority's existing points system for analogue services. Once the digital radio market has established a sufficiently significant audience, the Government will integrate the two points systems for analogue and digital radio into one system.

4.12 The Government proposes that:

(i) companies will be able to control up to 15 per cent of the points in the digital licensing system, together with 15 per cent of the points in the analogue system;

(ii) for national radio, any company will be able to hold one national digital radio licence in addition to any national analogue licence held;

(iii) for local radio, any company will be able to hold one local digital radio licence on each local multiplex in addition to any analogue licences held;

(iv) national newspaper groups with less than 20 per cent of national newspaper circulation may apply for one national digital radio licence (this number to be amendable by Order) and may own unlimited local digital licences up to the Authority's 15 per cent digital points limit;

(v) national newspaper groups with more than 20 per cent of national circulation will be restricted to a maximum stake of 20 per cent in any digital radio services;

(vi) satellite and cable broadcasters will be able to control unlimited digital radio broadcasting licences up to the 15 per cent digital points limit (subject to vii. below);

(vii) satellite and cable companies in more than 20 per cent ownership by a newspaper group with more than 20 per cent of the circulation market will be restricted to a maximum stake of 20 per cent in any digital radio services;

(viii) newspaper groups whose regional or local titles account for more than 30 per cent of the circulation in a digital radio licence area, will be limited to a maximum stake of 20 per cent in any such licences; and

(ix) cross-holdings between digital or analogue local radio and digital and analogue regional television licences will be limited to 20 per cent where their broadcast areas significantly overlap.

4.13 These rules more closely replicate those for analogue radio because, in the short term, the increase in the number of radio licences nationally or in any individual local area will be less significant than for television. The Radio Authority will, like the ITC, also apply the public interest criteria referred to in paragraph 4.10 above in considering applications for digital terrestrial radio licences where control of the licence rests with a newspaper company, and in considering the licensing implications of proposals for subsequent mergers between radio and newspaper companies.

(iv) Gateways

Multiplex providers

4.14 Multiplex providers will be in a position of some power, since any broadcaster must have a contract with a multiplex provider in order to obtain access to digital frequencies and there will only be a very limited number of frequency channels available. For that reason, the Government believes that there is a need for ownership

controls for television multiplexes. **The Government is minded to require that no one company should control more than two multiplexes. This would ensure at least three providers. However, the Government recognises that this would place restrictions on the way in which frequency channels might be packaged in order to attract the necessary levels of investment (see paragraph 2.45). It therefore invites views on this proposal.**

Conditional access

4.15 For subscription or 'pay-per-view' television, each multiplex provider, and/or the broadcasters with whom it is contracted, will need to make arrangements for conditional access – in particular for encryption and subscription management. In theory it would be possible for each different broadcaster to use a different encryption system. But this would be very expensive, unpopular with consumers and also inefficient. Similarly, it may well be more practical and efficient for a number of broadcasters to make use of a single subscription management centre.

4.16 The Government wishes to avoid a situation in which providers of encryption systems, or of subscription management systems, can favour one broadcaster, or multiplex provider, over another. Any provider of encryption or subscription management for digital terrestrial broadcasting should:

- not discriminate in favour of or against any particular multiplex provider or broadcaster; and
- not unreasonably refuse to offer its services to further multiplex providers or broadcasters on fair and reasonable terms.

4.17 The Government therefore proposes that providers of these systems to terrestrial multiplex providers or broadcasters should be licensed under the Telecommunications Act; after consultation on the licence conditions with the ITC and other interested parties, and subsequently regulated by OFTEL, working closely with the ITC, and that fair, reasonable and non-discriminatory dealing should be a condition of the licence. The licence conditions will reflect the EC Directive on Television Transmission Standards. The Government will be considering further the implementation of this Directive.

5 Conclusion

5.1 The Government believes that the arrangements set out in this document will create the best possible opportunity for the successful launch of digital terrestrial television and radio in the UK. They will ensure that viewers and listeners have more choice from a diversity of services, that the overall quality of services is high and that public service broadcasting is maintained into the new digital era. They will encourage fair and effective competition between multiplex providers and between broadcasters, and create opportunities for new entrants in both sectors. They will provide the manufacturing industry with the framework it requires in which to plan with certainty for the introduction of digital receivers, and will help the consumer in deciding to invest in those receivers. And, should the development of the market allow it, they will facilitate a smooth transition in the long term from analogue to digital, freeing radio frequency spectrum for other uses.

5.2 The Government will bring forward legislation at the earliest possible opportunity to effect these proposals. It will be consulting the Independent Television Commission and the Radio Authority on their roles in the new framework. **It would also welcome any comments or views on the proposals or their implementation, which should be sent by Friday 6 October to Broadcasting Policy Division (Digital), Department of National Heritage, 2–4 Cockspur Street, London SW1Y 5DH. Telephone: 0171-211 6464.**

Annexe A

Technical Annexe: Digital Broadcasting

The current transmission system

A1 Radio and television services in the UK are at present transmitted in analogue form. Sound and pictures are converted into continuously varying electric signals which after transmission are converted back to sound and pictures by radio and television receivers.

A2 Analogue transmission uses a spread of frequencies within the electromagnetic spectrum known as the bandwidth or channel. The amplitude or frequency of the wave is modulated to provide the sound and picture information needed by the receiver. The more information that needs to be conveyed, the broader the bandwidth; a television signal therefore takes up much more bandwidth than radio, and stereo radio more than mono.

Digital transmission

A3 Digital broadcasting is a new way of transmitting radio and television services. Sound and pictures are processed electronically and converted into binary digits – a series of noughts and ones. This code can then be transmitted as a bit stream and reconverted by appropriate receivers or set-top boxes into radio and television programmes.

A4 Digital signals are more robust than analogue ones and can be transmitted using less power. This allows frequency channels to be used for terrestrial digital transmission which are not available for analogue. In addition, a process known as video compression allows several digital programme services to be transmitted within the same frequency channel, whereas a single analogue programme service requires a whole frequency channel.

A5 Television pictures are a series of still frames which, when transmitted rapidly, provide moving pictures. But the differences between frames are often only very slight. Video compression allows the transmitter to send only the data needed to pass on those differences, and so cuts out a lot of repetitive information, making it possible to reduce quite significantly the bit rate required for transmission. The extent to which this compression can be applied depends upon the type of programming and the picture quality required: for example, 'talking head' programmes can be transmitted using a much lower bit rate than sport or action films. At certain times, therefore, a digital broadcaster might wish to split the capacity allocated to it, perhaps to provide two or more separate programmes, reunifying its broadcast service when it wishes to transmit something requiring a high bit rate.

A6 Similarly with audio signals, the ear and the brain can build up their understanding of a sound signal from only a part of the total sound which the ear can actually receive. Digital radio signals can also therefore employ compression techniques to strip away redundant information prior to transmission whilst ensuring that the quality of sound for the listener is not affected.

Multiplexing

A7 Digital broadcasting allows several signals to be carried within a single frequency channel. These signals are combined prior to transmission by a multiplex, which packages and identifies chunks of each signal and sends them sequentially so that they can be separated and decoded by the receiver. The multiplex provider takes the signals of individual broadcasters, assembles them into a multiplexed digital bit stream, modulates the bit stream, amplifies it and passes it to aerials sited on radio masts at the relevant transmitter sites. For this purpose the multiplex provider will need commercial contracts with existing owners of site and mast facilities. It will also be responsible for the planning and procurement of the necessary transmission equipment.

Conditional access

A8 A conditional access system enables a broadcaster to ensure that only those who have paid for a particular broadcast service are able to receive it. Picture and sound information is transmitted to the viewer in a scrambled form and an encrypted message allowing descrambling of that information is transmitted simultaneously. To unlock that message, the subscriber needs a key, an important part of which for satellite and terrestrial systems is at present provided via a smartcard. The subscriber inserts the smartcard into a slot in the set-top box, though it would be technically possible for the slot to be in the receiver itself. If different encryption systems were being used by different broadcasters, the viewer would require for each system either a separate set-top box or, if the set-top box or receiver contained an interface common to all encryption systems, a separate small attachment containing a slot for the smartcard.

A9 The smartcard can be disabled by the conditional access provider (although only while it is inserted) through the sending of an individual message, if the subscriber has not kept up payments. This is administered through the subscription management service, which handles subscription requests and payments from viewers. Current cable systems do not use a smartcard since the key can be sent directly to, or removed from, an individual subscriber from the cable company's 'headend', from which transmission is relayed.

Frequency availability – television

A10 During the first stage of development, digital terrestrial television services will be transmitted alongside the current analogue television services in the UHF spectrum, making use of spare and so-called 'taboo' frequency channels. Taboo channels cannot be used for analogue television because of interference, but they can for digital television which can be transmitted at much lower power.

A11 In July 1994, the Government announced that as many as 12 digital terrestrial television services might be available using Channel 35 as a Single Frequency Network providing four services to more than 95 per cent of the population, and eight other services from interleaved frequency channels allowing regional variations to around 80 per cent of the population. Without using Channel 35, the ITC now hopes to identify six interleaved frequency channels giving substantial national coverage, each capable of providing three programme services of excellent picture quality. Two channels might in the medium term be available to over 90 per cent of the population, two to over 80 per cent and two to between 60 and 70 per cent. These later ITC figures are for higher picture quality – 6 Mbits/s as opposed to 5 Mbits/s per service – within frequency channels of approximately 18–20 Mbits/s. More channels may become available with more local coverage. The use of Channel 35 remains an additional option, but more work remains to be done on the implications of using Channel 35 for the technical standards (and cost) of receivers.

A12 A considerable effort is required to map digital television services into the frequency channels available between existing analogue services, and to assess the extent of any interference with video recorders or other equipment. This work is coordinated in the UK by the Radiocommunications Agency, which is also responsible for seeking international approval for UK digital frequency plans. It is intended to establish a reasonably stable frequency plan early in 1996.

Frequency availability – radio

A13 There is no space available within the existing analogue FM band to introduce DAB. To allow DAB to begin and subject to certain international constraints, the Government has therefore made available some 12.5 MHz of spectrum outside the existing sound broadcasting allocation.

A14 The seven frequency channels available will each be able to carry six stereo or a greater number of mono services. Four frequency channels are needed to allow at least one local DAB multiplex to be available to every area of the country. Two further channels have been allocated to provide two national multiplexes. The remaining channel could be used to provide extra local services where demand is greatest, or to provide a further quasi-national service, with limitations on coverage.

Additional services

A15 The bit rate required for data services is considerably less than that required for television, so a considerable amount of information can be transmitted without adversely affecting television picture quality on the same frequency channel. There are two ways in which the transmission of data services can be organised within a digital frequency channel used for television transmission. A small part of the bit stream capacity can be allocated exclusively to data and kept clear of the television signal. This would be necessary for the transmission of conditional access information and of subtitling, which must reach the receiver simultaneously with the picture and sound to which it refers. Alternatively, data capacity can be greatly increased by making use of 'picture redundancy' *within* the part of the bit stream allocated to television. When the picture contains high levels of detail and motion, a high bit rate is required. However, when the picture is less complex, a large part of the bit rate

allocated to television transmission will be redundant and can be temporarily switched to data services until it is required again for the television signal. As the availability of this additional capacity is dependent upon the picture content and changes therein, it is not suitable for applications which require 'real-time' distribution. However, most data applications will not require that. There may also be scope for additional services on DAB frequencies, though there is no equivalent for radio of picture redundancy.

International standards

A16 Technical work on digital television standards within Europe is being taken forward by the Digital Video Broadcasting (DVB) Group. The Group is supported by the European Commission and consists of over 140 manufacturers, broadcasters and regulatory organisations. Its work is at an advanced stage, with standards for digital cable and satellite television transmission available now. European Standards for digital terrestrial television are expected to be finalised by early 1996.

A17 One issue remains to be resolved. A choice of standard needs to be made for terrestrial digital television between a system where the digital signal is spread across 8000 carriers within the frequency channel or one where 2000 carriers are used. An 8000 carrier system would be able to support wide-area Single Frequency Networks (SFNs), possibly on a national scale. A 2000 carrier system would require an interleaved system of a number of different frequencies to achieve national coverage. A Single Frequency Network allows very efficient use of the spectrum, but interleaved systems using 2000 carriers could be introduced faster and would allow for cheaper receivers. In addition, there is scope, even with 2000 carriers, for many relays to operate on the same frequency as main transmitting stations, increasing the coverage of the signal. This will enhance the efficiency of interleaved networks.

A18 For radio, the EUREKA 147 Digital Audio Broadcasting System was developed in Europe and standardised by the European Telecommunications Standards Institute in December 1994. In June 1995 it was approved as a world standard.